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REPORTS ON AURORA BOREALIS BY  
METEOROLOGICAL STATIONS IN COMMUNIST CHINA

by Tseng Ch'iang-wu and Feng Yu-chiu

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## FOREWORD

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Following is a translation of two articles from the Chinese-language monthly T'ien-ch'i Yueh-k'an (Weather Monthly), Peiping, No. 9 23 September 1959, page 47. Authors are given under the individual article headings.

I. AN INCIDENCE OF INTENSE AURORAE PHENOMENON

Tseng Ch'iang-wu,  
I-ch'un Meteorological  
Station,  
Heilungkiang Province

My station position was latitude  $47^{\circ}30'$  north longitude  $129^{\circ}20'$  east at the elevation of 231.3 meters.

Fading strato-cumulus clouds still remained all over the sky on the early evening of July 15 1959. Under the slanting rays of the setting sun it created a specter of red evening fog. Although our station had received reports on the polar aurorae from the International Geophysical Year we were unable to proceed with our observations at this time. It was not until 2158 hours (Peking time; same time standard used hereafter) that the evening fog disappeared, and the sky became clear for ten thousand li (---became clear way up to the distant horizon.). At this time the sky revealed a curtain of light pink extending from the north-east to the northwest. This was the polar aurorae. At the same time a bright half moon was in the sky, and the color of the aurorae light was not bright and clear. However, upon close observation, it can be seen that this light curtain was not stationary. At times the light was bright and intense, and at times it was dim. At times several columns of light were seen to shoot out from the light curtain. These light columns varied in quantity - numerable and scant at times.

At 2339 hours the moon went down. At this time the entire northern sky became a blanket of bright red as if lighted by a fire from far away. From the curtain of red light there appeared thirty and some odd vibrating X light bands of exceptional brightness and beauty that extended into the sky at an inclination angle of  $70^{\circ}$ . Changes in color of these light bands were very rapid. The light bands on the left were dark red, and

those on the right were orange yellow. And in the next moment the colors on left and right exchanged themselves. During the brief moment when the colors changed positions, they were especially beautiful and a light to behold. At zero hours three columns of pale green light appeared at the north-northeastern part of the sky, and their changes in color were very much like an emerald sparkling in the sunlight. However the beauty of these colors are seldom seen.

At 0115 hours in the declination between  $290^{\circ}$  and  $60^{\circ}$ , the aurorae lights were especially intensified with a drape of pink light as the background and displayed different kinds of strange and beautiful patterns. At times these patterns appeared like vibrating columnar-like bands of light fire-red at the bottom part and pale green in the upper part; at other times the light columns shot out like beams from searchlights with the light columns on the west side displaying deep coloration, a deep red, and the light columns on the east side displaying lighter coloration, orange yellow; at times the intensifying and dimming of the lights were like passing rain clouds obscuring the sunlight with the fine small streaks of light ready to shoot out. At this time the inclination angle was  $75^{\circ}$ .

The aurorae light was brightest during the phase between 0145 and 0205 hours. The display was brighter than when there was no ring impeding airflow, but the difference was not great (about 3 percent). It was a beautiful sight, and it was clearly seen that the polar aurorae had reached its zenith in the sky. On close observation the whole zenith displayed a pink color and luminescence in the northern half was more intense, with luminescence weaker in the southern half. The luminescence is slightly stronger than the faint glowing aurorae. Furthermore a strange phenomenon appeared in the due northern part of the sky (inclination angle about  $40^{\circ}$ ). It was a strange luminescent ball popping out like sprays of water shooting up when a rock is thrown into a pool of water. The color was dazzling pure white like the colored sparks flying out from arc welding. This phenomenon continued for about 40 seconds. At 0153 hours suddenly there appeared six columns of white light in the zenith whose color was like sunlight piercing through the clouds. The length of their angle of sight was  $30^{\circ}$ , and their positions ranged from north to south. At 0205 hours the polar aurorae in the northwest was like the brilliant glare of tongues of fire waving to and fro in the wind. It was especially dazzling to the eyes.

At 0215 hours dawn appeared in the east with the aurorae light diminishing in intensity although the entire sky was still wrapped in pale pink. At 0231 hours, the east was completely lighted, and the polar aurorae fuzzily disappeared. It is estimated that the polar aurorae was still very intense and perhaps continued for a longer period of time.

During this night of the appearance of the polar aurorae, the whole sky was cloudless. On the horizon at the point where the sky meets the earth a pale brown color was observed. Among the several observations we have made on the phenomenon of the polar aurorae, the colorations displayed were the most beautiful this time, the light was the most intense, and the time was most prolonged. Also it was a phenomenon in which many variations and changes occurred in this intense aurorae activity. One of the seldom observed results showed that the inclination angle reached  $90^{\circ}$  and enveloped the entire sky. To be able to view such a phenomenon from the latitude position of our observation post was uncommon indeed.

## II. OBSERVATION REPORT ON THE POLAR AURORAE PHENOMENON

Feng Yu-chiu,  
Shan-t'an Hsien Central  
Meteorological Station,  
Kansu Province

The position of our station is latitude  $38^{\circ}47'$  N, longitude  $101^{\circ}05'$  E. At 0220 hours local time on the 16th of July, there appeared behind Lung-shou-shan a curtain of pale red light. In the beginning this luminescent curtain was due north. Its light intensity was not too intense and its area was not too large. It was like fire from the ground reflected in the sky. Its inclination was about  $25^{\circ}$ . At 0230 hours, the pale red colored luminescent slightly increased in intensity with a corresponding enlargement of area illuminated. At this time its inclination was around  $30^{\circ}$ . Although it did not display distinct light columns, it nevertheless showed streaks of sharp red light which were much more beautiful than the beginning of the appearance. This light curtain began to move toward the NNW direction at 0240 hours and the luminescent curtain ceased to enlarge, and it began to pale. At 0255 hours it disappeared.

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